An Interdisciplinary Analysis of Multispectral Satellite Data for Selected Cover Types in the Colorado Mountains, Using Automatic Data Processing Techniques

EREP S398

Monthly Progress Report for September 1974

NASA Contract NAS 9-13380

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A. Overall Status and Progress to Date

During the past month the inventory for all the Colorado SKYLAB data currently available in-house has been completed. We have produced a list of all the imagery, their identification numbers and type. Simultaneously the data has been plotted in overlay form for the SL-2, SL-3, and SL-4 data that covers one of the Colorado test sites (San Juan Mountains).

There is no SL-2 data in-house for the Indian Peaks test site. For this site, there is SL-3 and SL-4 imagery; however, in the one case (SL-3) it is 100% cloud covered and on the other (SL-4) it is 100% snow covered. Table 1 indicates the frame numbers of the different data types that completely or partially cover the San Juan test site.

Two test sites have been defined for use in the Ecological Inventory of the SKYLAB contract based upon the data in-house to date. The Granite Peaks study area has been defined as a six 7 1/2 minute quadrangle area including the following quadrangles: Vallecito Reservoir, Ludwig Mountain, Granite Peak, Baldy Mountain, Bear Mountain, and Devil Mountain. The Rio Grande study area has been defined as a four 7 1/2 minute quadrangle area including the Finger Mesa, Weminuche Pass, Bristol Head (South West 1/4) and Little Squaw Creek quadrangles. Type maps have been made for all of the quadrangles except the Bristol Head SW quadrangle.

The Granite Peak study area will be the primary study area since the area is essentially cloud and snow free and data was collected for SL-2 and SL-3. The Rio Grande study area is the secondary test site and will be used to study the results and conclusions obtained from the Granite Peaks study area.

ERTS-1 data from June 5, 1973 (frame ID 1317-17204) will be used as the data base. All test fields to be used in evaluating the classifications accuracy will be defined in the data base. The data base will also be used to define the test site and generally control the location of training areas. A computer printout of the data base has been obtained and the process of defining test fields has commenced.

The Exotech spectra of the rock samples taken from the San Juan test site are being studied in an effort to combine them into groups with similar characteristics. A comparison will then be made between rocks grouped by spectral characteristics and rocks grouped by type. The spectra has also been broken into the channels used on the SKYLAB to compare with the 192 MSS data.

B. Recommendations

The SL-3 S192 data should be sent to LARS as soon as possible for analysis.

C. Expected Accomplishments

Documentation on the snow-cloud differentiation by the middle infrared channels on SKYLAB has been initiated and is currently expected to be completed by October 31, 1974. Since no day of arrival has been determined for the SL-3 S192 data, the topographic information generated by the Defense Mapping Agency will be overlayed on the current non-filtered SL-2 data for the San Juan Mountains test site.

D. Significant Results

There are no author identified significant results contained within this report.

E. Summary Outlook

E.1 The specific analysis sequences to be pursued during the next three months are being defined and will be documented in outline form by October 31. This activity will allow a revised milestone plan to be developed and submitted in November.

E.2 Personnel working on the topographic studies have succeeded in obtaining topographic printouts of the study area and have initiated the overlaying of the topographic data onto the SKYLAB scanner data. Preliminary difficulties because the SKYLAB data the Defense Mapping Agency topographic data tapes are oriented nearly 180^{o} out of phase from each other can probably be overcome by the end of October.

E.3 Because the Granite Peaks test site is common to both SL-2 and SL-3 192 data sets, preliminary classifications with the filtered SL-3 data will be compared to the unfiltered SL-2 data results as soon as the SL-3 data becomes available. Photointerpretation has already indicated that there has been a considerable change in the spectral characteristics of the cover types between SL-2 and SL-3 due to seasonal effects. However there is considerable concern about any SL-2 and SL-3 data comparisons because of the interaction between temporal changes and the fact that the SL-2 data set is unfiltered data whereas SL-3 will be filtered data. A comparison to determine the effect of the digital filtering upon the data quality could be made if a digitally filtered data set could be obtained from the SL-2 data over the Granite Peaks test site. A request for such a set of digitally filtered data will be generated as soon as it becomes apparent that such a data set is required in order to satisfactorily complete the objectives of this SKYLAB project.

F. Travel Summary

There were no funds expended from this contract for travel during this reporting period.

TABLE I. SKYLAB DATA AVAILABLE OVER THE SAN JUAN TEST SITE

Mission	Sensor	Frame Number	Band
SL-2	S190B	81-020 through 81-023	Color positive
	S190A	07-016 and 07-017	.7-.8 pos. & neg.
		08-016 and 08-017	.8-.9 pos. & neg.
		09-016 and 09-017	Color IR
		10-016 and 10-017	Color positive
		11-016 and 11-017	.6-.7 pos. & neg.
		12-016 and 12-017	.5-.6 pos. & neg.
	S192	(73088601)	(Screening film & CCT in-house)
SL-3	S190B	83-311 and 83-312	Color positive
	S190A	19-330	.7-.8 pos. & neg.
		20-330	.8-.9 pos. & neg.
		21-330	Color IR
		22-330	Color positive
		23-330	.6-.7 pos. & neg.
		24-330	.5-.6 pos. & neg.
	S192	(CCT has been ordered)	(screening film in-house)
SL-4	S190B	94-095 and 94-096	Color positive
	S190A	73-353	.7-.8 pos. & neg.
		74-353	.8-.9 pos. & neg.
		75-353	Color IR
		76-353	Color positive
		77-353	.6-.7 pos. & neg.
		78-353	.5-.6 pos. & neg.
	S192	(Not available in CCT)	(Only screening film in-house)